

STUDIES OF PACIFIC ISLAND PLANTS, XIV
NOTES ON THE FIJIAN SPECIES OF CYRTANDRA

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THE ONLY REVISION which treats the vast genus *Cyrtandra* (Gesneriaceae) in its entirety is that of C. B. Clarke (in DC. Monogr. Phan. 5: 1–303. 1883), and this of course is entirely out of date. In it the 167 recognized species of *Cyrtandra* are arranged in 13 sections, which have seemed to most subsequent students highly artificial. The total number of described species of the genus is now at least double the number known to Clarke. It may prove quite impossible to revise *Cyrtandra* for its entire range, unless some competent student is willing and able to spend many years at this task alone and to supplement his work by intensive field study. Regional solutions, however, are quite feasible, and these may follow the precedent set by J. F. Rock for the Hawaiian species (in Am. Jour. Bot. 4: 604–623. 1917, 5: 259–277. 1918, 6: 47–68, 203–216. 1919), in which Clarke's sections are ignored.

The purpose of the present paper is in no sense revisional; it is intended only to place on record the ten species collected by me in 1947¹ that appear to be undescribed, and to note pertinent data concerning a few of the older species. With these ten new species, *Cyrtandra* is now represented in Fiji by 45 species, as contrasted with the 20 species of the region known to Clarke. For convenience, the sequence here followed is that of Clarke, but the writer hopes in the near future to revise the Fijian species, and at that time more suitable groupings can be devised. It is not to be supposed that all the Fijian *Cyrtandrae* are now known; on the contrary, further intensive collecting in the wet montane forest is certain to disclose undescribed entities. The genus is second in size only to *Psychotria*, in Fiji, and it definitely includes some of the most beautiful species of undershrubs and low trees to be found in the Melanesian forests. Specimens cited in the present paper are deposited in the herbaria of the Arnold Arboretum (A) and the U. S. National Museum (US).

Cyrtandra victoriae Gillespie in Bishop Mus. Bull. 74: 25. fig. 34. 1930.

VITI LEVU: Mba: Mt. Ndelaiyoö, on the escarpment west of Nandarivatu, *Smith* 5081 (A, US); upper western slope of Mt. Tomanivi, *Smith* 5915, 5916, 5917 (all A, US); Ra: Ridge from Mt. Namama (east of Nandarivatu) toward Mt. Tomanivi, *Smith* 5697, 5722 (A, US).

The cited specimens are from shrubs or low trees 2–5 m. high, growing in dense wet forest; the flowers are large and conspicuous, the white corolla

¹ These collections were made under the auspices of the Arnold Arboretum of Harvard University and the John Simon Guggenheim Memorial Foundation, with the aid of grants from the Penrose Fund of the American Philosophical Society and the Bache Fund of the National Academy of Sciences.

having a pale yellowish pubescence. This very striking species, typified by a Gillespie collection from Mt. Tomanivi, is one of the most beautiful Fijian *Cyrtandrae* and is fairly frequent at elevations of 900–1300 m. in north-central Viti Levu. The leaves vary tremendously in size during their development, the chief vegetative characteristic of the plant being the dense indument of multicellular eglandular hairs (3–8 mm. long) that covers all the young parts and is often long-persistent. A few supplementary notes may be added to Gillespie's description, as follows: Calyx copiously sericeous within toward base with hairs 3–4 mm. long (not glabrous as described), the lobes 4 or 5, lanceolate, up to 2 cm. long, the 2 or 3 upper ones joined by the tips or laterally connate; corolla up to 4 cm. long, 3–5 mm. in diameter at base, broadened at throat to about 15 mm. in diameter, copiously pilose without like the calyx, less densely short-pilose within, the hairs several-celled and usually gland-tipped, interspersed with very short glandular hairs, the lobes 5–6 mm. broad; disk glabrous, about 1.5 mm. high; ovary glabrous, the style stout, copiously glandular-pilose.

Cyrtandra tomentosa A. C. Sm. in *Sargentia* 1: 116. 1942.

VITI LEVU: Mba: Hills east of Nandala Creek, about 3 miles south of Nandarivatu, alt. 850–970 m., *Smith* 6237 (A, US) (shrub 2 m. high, in dense forest; fruit green).

The cited specimen, the second known of the species, agrees excellently with the type, *Degener* 14889, in all respects. Its leaves are slightly larger (petioles up to 6 cm. long; blades up to 35×9 cm.). The type locality, Nandrau, falls in the present province of Nandronga & Navosa and is slightly south of the region cited above.

Cyrtandra amicta sp. nov.

Frutex ad 4 m. altus saepe caule simplici, ramulis incrassatis (apicem versus ad 2 cm. diametro) obtuse quadrangularibus juventute obscure pilosis mox glabratibus; foliis oppositis apices ramulorum versus congestis magnis, petiolis crassis semiteretibus 4–12 cm. longis fere ad basim alatis inconspicue pilosis glabratibusve, laminis in vivo carnosius in sicco papyraceis supra fusco-viridibus subtus pallidioribus, obovatis vel oblanceolatis, 40–70 cm. longis, 12–22 cm. latis, inferne gradatim angustatis et in petiolum longe decurrentibus, apice breviter acuminatis, margine undulatis ac etiam irregulariter et minute calloso-serrulatis, supra glabris vel interdum pilis multiseptatis ad 2 mm. longis subpersistenter pilosis, subtus nervis et interdum facie pilis aureis debilibus 0.1–0.5 (–1) mm. longis molliter pilosis demum subglabratibus, costa valida supra elevata subtus prominente, nervis secundariis utrinsecus 15–20 arcuato-adscendentibus copiose anastomosantibus supra inconspicue subtus valde elevatis, nervis tertiariis et rete venularum laxis supra immersis subtus prominulis; inflorescentiis axillaribus multifloris compacte cymosis multibracteatis laxae capitatis ad 10 cm. diametro, bracteis omnino liberis submembranaceis oblongo-

lanceolatis, 25–30 mm. longis, 7–10 mm. latis, subacutis, intus basim versus pilis aureis debilibus pluriseptatis 2–3 mm. longis villosis cetera glabris; pedicellis crassis teretibus glabris sub anthesi 6–10 mm. longis; calyce amplo membranaceo campanulato-infundibulari sub anthesi 35–40 mm. longo et basim versus 6–10 mm. diametro, superne latiore, extus glabro, intus basim versus ut bracteis debiliter piloso, inaequaliter 5-lobato, lobis deltoideis vel deltoideo-lanceolatis $5-12 \times 3-10$ mm.; corolla membranacea inconspicue nervata infundibulari sub anthesi 40–45 mm. longa et basim versus 5–7 mm. diametro, superne ampliata, extus glabra (interdum juvenili tubo pilis ut bracteis floccoso-villosa mox glabrata), intus glabra, lobis 5 leviter inaequalibus semiorbiculari-oblongis in alabastro late imbricatis sub anthesi patentibus 7–10 mm. longis latisque; staminibus glabris tubo corollae supra medium affixis, filamentis crassis leviter complanatis 3–5 mm. longis, antheris oblongis 4–5 mm. longis utroque rotundatis; disco crasse carnosio glabro annulari-cupuliformi 1.5–2 mm. alto apice undulato; ovario graciliter ovoideo glabro vel superne parce piloso, stylo crasso tereti sub anthesi circiter 15 mm. longo pilis patentibus 0.3–0.7 mm. longis pluriseptatis capitato-glandulosis copiose piloso, stigmate subclavato demum bilobato, lobis complanatis; fructibus juvenilibus (calyce caduco) elongato-ovoideis in sicco rugulosis.

VITI LEVU: Mba: Eastern slopes of Mt. Koroyanitu, Mt. Evans Range, *Smith* 4243, 4244 (A, US); upper western slopes of Mt. Tomanivi [Mt. Victoria], alt. 1100–1150 m., Sept. 6, 1947, *Smith* 5914 (A TYPE, US); hills east of Nandala Creek, about 3 miles south of Nandarivatu, *Smith* 6223 (A, US); Nandronga & Navosa: Northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau, *Smith* 5654 (A, US).

The cited specimens are from often simple-stemmed shrubs 1.5–4 m. high, occurring at elevations of 850–1150 m. in dense forest. The bracts, calyx, and corolla are white, the fruit becoming white at maturity and up to 2.5 cm. in length. The leaves are characteristically congested toward the apex of the plant, concealing the densely clustered axillary inflorescences.

Cyrtandra amicta is strongly characterized by its glabrous flowers and its remarkably long calyx, which approximates the corolla in length and conceals it except for the tip. Its relationship is with *C. vitiensis* Seem. (§ *Decurrentes*), which it resembles closely in having its large leaf-blades gradually narrowed and long-decurrent at base. However, *C. vitiensis* has the calyx only about half as long as that of the new species, while its corolla is sericeous without. I believe that *C. vitiensis* is represented in my 1947 collections by nos. 5103, 5315, and 5848, from Mt. Tomanivi and vicinity; these numbers differ from the new species in the stated floral characters, in having the calyx uniformly long-pilose within, and in their more obvious and persistent foliage-indument.

Cyrtandra occulta sp. nov.

Frutex ad 2 m. altus, caule simplici valido apice ad 2 cm. diametro saepe fistuloso primo debiliter piloso mox glabrato; foliis oppositis magnis.

petiolis crassis canaliculatis 2–8 cm. longis ad basim alatis mox glabratiss. laminis in vivo carnosiss in sicco subcoriaceis vel chartaceis supra fusco-viridibus subtus pallidioribus, obovatis vel oblanceolatis, 30–40 cm. longis, 10–16 cm. latis, basim versus gradatim angustatis et in petiolum longe decurrentibus, apice ut videtur acutis, margine undulato-crenulatis etiam irregulariter calloso-denticulatis, utrinque praecipue nervis pilis aureis debilibus 0.5–2 mm. longis molliter pilosis, supra mox glabratiss et minute pustulosis, subtus demum subglabratiss, costa valida supra elevata subtus prominente, nervis secundariis utrinsecus 18–22 curvatis obscure anastomosantibus supra subplanis subtus prominentibus, nervis tertiariis et venulis laxis subimmersis; inflorescentiis axillaribus multifloris compacte cymosis subcapitatis 3.5–5 cm. diametro multibracteatis, bracteis extimis in involucrium latum cupuliforme connatis submembranaceis utrinque copiose tomentosis, pilis pallide aureis debilibus pluriseptatis extus 2–3 mm. longis demum caducis intus 5–8 mm. longis densissimis persistentibus, bracteis interioribus numerosis membranaceis oblongis ad 3×1.5 cm. similiter pilosis; pedicellis crassis (2–3 mm. diametro) teretibus sub anthesi 5–10 mm. longis persistenter debiliter pilosis (pilis 2–3 mm. longis pluriseptatis); calyce membranaceo campanulato sub anthesi 20–22 mm. longo et basim versus circiter 10 mm. diametro superne latiore, utrinque pilis eis bractearum similibus densissime sericeo, apice in lobos deltoideo-lanceolatos inaequaliter fisso; corolla membranacea infundibulari sub anthesi 30–35 mm. longa et basim versus 5–7 mm. diametro, superne ampliata, extus pilis 5–7 mm. longis septatis copiose et persistenter sericeo-tomentella, intus praeter basim versus ubique copiosissime glanduloso-pilosa (pilis minutis patentibus, stipite ad 0.2 mm. longo vel subnullo plerumque 2–4-septato apice capitato-glanduloso), lobis 5 subaequalibus oblongis rotundatis 5–7 mm. longis latisque; staminibus glabris tubo corollae medium versus affixis, filamentis crassis leviter complanatis circiter 5 mm. longis, antheris oblongis circiter 4 mm. longis utroque rotundatis; disco crasse carnosoglabro annulari-cupuliformi 1.5–2 mm. alto margine integro; ovario graciliter ovoideo glabro, stylo crasso tereti sub anthesi 10–15 mm. longo superne pilis pluriseptatis 0.2–0.5 mm. longis capitato-glandulosis copiose piloso, stigmate subpeltato bilobato; fructibus juvenilibus (calyce caduco) elongato-ovoideis apice acutis.

VITI LEVU: Mba: Upper western slopes of Mt. Tomanivi [Mt. Victoria], alt. 1100–1150 m., Sept. 6, 1947, *Smith 5913* (A TYPE, US) (simple-stemmed shrub 2 m. high, in dense forest; bracts greenish white; corolla and young fruit white); Naitasiri: Northern portion of Rairaimatuku Plateau, between Mt. Tomanivi and Nasonggo, alt. 870–970 m., *Smith 5792* (A. US) (simple-stemmed shrub 1–2 m. high, in dense forest; bracts white).

The species here described closely resembles in foliage *C. vitiensis* Seem. and *C. amicta*, above described, and is probably also referable to § *Decurrentes*. It is readily characterized by its large subcapitate inflorescence surrounded by coalescent and copiously pilose outer bracts, by having its large calyx densely long-sericeous on both sides, and by its copiously

sericeous corolla, which is densely glandular-pilose within. An examined isotype of *C. vitiensis* (Seemann 277, from the vicinity of Namosi) at the Gray Herbarium has lost the outer bracts of the inflorescence, and so a comparison on this score cannot be made. However, *C. occulta* differs obviously from *C. vitiensis* in its densely pilose calyx. From *C. amicta* the new species is readily separated by its large coalescent bracts, its more copious inflorescence-indument, its shorter calyx, and the glandular indument of the inner surface of its corolla, as well as by obvious differences in leaf-texture, surface, and venation.

***Cyrtandra leucantha* sp. nov.**

Frutex ad 3 m. altus, ramulis gracilibus apices versus subquadrangularibus 3–5 mm. diametro pilis brunneis pluriseptatis 0.5–0.8 mm. longis patentibus copiose indutis demum subglabratibus; foliis oppositis apices ramulorum versus subcongestis, petiolis gracilibus leviter canaliculatis vel semiteretibus 3–6 cm. longis ut ramulis juvenilibus pilosis, laminis in sicco papyraceis supra fusco-viridibus subtus pallidioribus, oblanceolatis vel obovatis, 20–37 cm. longis, 7.5–14 cm. latis, inferne gradatim angustatis et in petiolum longe decurrentibus, apice breviter acuminatis vel cuspidatis, margine copiose sed irregulariter calloso-serratis, supra pilis multiseptatis 1–1.5 mm. longis copiose patentibus pilosis, margine pariter ciliatis, subtus etiam copiose pilosis (pilis nervorum similibus, eis facie pallidioribus interdum unicellularibus 0.3–0.5 mm. longis), costa et nervis secundariis utrinsecus 9–13 arcuato-adscendentibus supra subplanis subtus prominentibus vel valde elevatis, nervis tertiariis et rete venularum intricato supra immersis subtus prominulis; inflorescentiis axillaribus cymosis multifloris congestis, bracteis liberis papyraceis ellipticis vel suborbicularibus, 6–8 mm. diametro, apice rotundatis, margine distali undulatis, utrinque glabris vel basim versus obscure pilosis, pedunculo brevi, pedicellis gracilibus sub anthesi 6–9 mm. longis glabris; calyce submembranaceo cylindrico-campanulato, sub anthesi 16–17 mm. longo, basim versus circiter 5 mm. diametro superne ad 8–9 mm. diametro gradatim ampliato, extus praeter basim versus pilis numerosis patentibus 0.5–1 mm. longis (stipitibus 3–6-septatis gracilibus apice capitato-glandulosis raro eglandulosis) praedito, intus glabro basi sericeo excepto, lobis 5 suberectis subaequalibus deltoideis circiter 3×4 mm. apice obscure calloso-mucronulatis; corolla membranacea cylindrica sub anthesi circiter 20 mm. longa et basim versus 4 mm. diametro, faucibus paullo ampliata, extus superne ut calyce glanduloso-pilosa, intus glabra, lobis 5 subaequalibus patentibus suborbicularibus circiter 4 mm. diametro; staminibus tubo corollae supra medium affixis, filamentis gracilibus 2–3 mm. longis, antheris ellipsoideis circiter 3 mm. longis; disco glabro breviter tubuloso circiter 1.5 mm. alto; ovario graciliter ovoideo glabro, stylo crasso circiter 8 mm. longo parce glanduloso-piloso, stigmate complanato bifido; fructibus ellipsoideis maturis circiter 15 mm. longis in sicco rugulosis, apice styli basi apiculatis, calycis limbo et disco mox caducis sed pilis calycis basis subpersistentibus.

VITI LEVU: Mba: Western slopes of Mt. Nanggaranambuluta [Lomalangi], east of Nandarivatu, alt. 850–1000 m., *Smith 4767* (A, US) (*mbeta kai*: simple shrub 1–1.5 m. high, in dense forest; fruit white), *6312* (A TYPE, US) (Oct. 2, 1947; shrub 3 m. high, in dense forest; calyx and corolla white); vicinity of Nandarivatu, alt. 800–900 m., *Degener & Ordenez 13523* (A, US) (shrub to 2 m. high, in dark wet forest; calyx and corolla white); Nandala, near Nandarivatu, *Degener 14836* (A, US) (*mbeta*; sparingly branched shrub 2 m. high, in dense forest; bracts white).

The last two specimens cited were originally distributed as *C. glandulosa* Gillespie, a species similar in the indument of its calyx and corolla. Further examination indicates that these plants do not represent *C. glandulosa*, which, however, appears to occur in my present collection in no. 4129 (A, US), from the Mt. Evans Range of northwestern Viti Levu. The new species here described differs from *C. glandulosa* in the much shorter indument of its branchlets and leaves, in having its leaf-blades long-attenuate at base and the petiole comparatively short and slender, in its much smaller inflorescence-bracts, its comparatively small flowers, its white rather than yellow corolla, and its caducous calyx. The fact that the calyx of *C. leucantha* is not saccate and persistent would, in Clarke's system, remove it from the alliance of *C. glandulosa*. A closer relative of the new species is perhaps *C. desvoeuxii* Horne ex Clarke (represented in my present collection by no. 5101 [A, US], from Mt. Tomanivi), which Clarke placed in his § *Aureae*. *Cyrtandra desvoeuxii* is a very robust species, with flowers approaching those of *C. glandulosa* in size. It is possible that *C. glandulosa* also belongs in § *Aureae* rather than in § *Campanulaceae*, where it was placed by Gillespie.

Cyrtandra chlorantha sp. nov.

Frutex ad 4 m. altus, ramulis gracilibus obscure quadrangularibus apices versus 3–4 mm. diametro pilis patentibus 2–4 mm. longis multiseptatis brunneis eglandulosis (vel interdum capitato-glandulosis) copiose indutis demum subglabris; foliis oppositis, petiolis gracilibus leviter canaliculatis 3–4 cm. longis ut ramulis juvenilibus pilosis, laminis in sicco papyraceis supra fusco-viridibus subtus pallidioribus, lanceolatis vel anguste ellipticis, 14–19 cm. longis, 5–8 cm. latis, basi attenuatis et in petiolum longe decurrentibus, apice cuspidatis, margine dentibus irregularibus 1 vel 2 per centimetrum calloso-serratis, supra dispersim pilosis (pilis multiseptatis 1.5–3 mm. longis), subtus similiter pilosis vel pilis faciei brevioribus, margine pariter ciliatis, costa supra leviter elevata subtus prominente, nervis secundariis utrinsecus 7–9 adscendentibus supra planis subtus elevatis, rete venularum supra subimmerso subtus prominulo; inflorescentiis axillaribus cymosis paucifloris, pedunculo ad 1 cm. longo subglabrato, bracteis liberis papyraceis ellipticis vel ovatis, 12–16 mm. longis, subacutis, margine undulatis, utrinque pilis multiseptatis 1–2 mm. longis plerumque capitato-glandulosis parce patentipilosis, pedicellis gracilibus sub anthesi 5–8 mm. longis superne ut calyce pilosis; calyce submembranaceo campanulato sub anthesi 15–18 mm. longo et basim versus 5 mm. diametro superne ad

10 mm. diametro ampliato, extus pilis 2–3 mm. longis pluriseptatis capitato-glandulosis (glandulis interdum caducis) copiose et uniformiter patentipiloso, intus similiter sed parcius pilosis, lobis 5 inaequalibus deltoideis 2–5 mm. longis obtusis; corolla membranacea cylindrica viridi sub anthesi circiter 22 mm. longa et basim versus 5 mm. diametro, extus ut calyce copiose et subtiliter glanduloso-pilosa, intus glabra, apice in lobos 5 subaequales late imbricatos suborbiculares circiter 5 mm. diametro abrupte incrassata; staminibus tubo corollae supra medium affixis, filamentis circiter 5 mm. longis, antheris ellipsoideis circiter 3.5 mm. longis; disco cupuliformi glabro circiter 1 mm. alto; ovario ovoideo glabro, stylo circiter 10 mm. longo pilis ad 0.5 mm. longis glanduloso-piloso, stigmatе bifido.

VITI LEVU: Naitasiri: Northern portion of Rairaimatuku Plateau, between Mt. Tomanivi [Mt. Victoria] and Nasonggo, alt. 870–970 m., Aug. 21, 1947, *Smith 5789* (A TYPE, US) (shrub 3–4 m. high, in dense forest; bracts and calyx pale green; mature corolla bright green; anthers white; young fruit green).

The new species is of the general relationship of *C. leucantha*, described above, and for the present appears best referred to § *Aureae*. *Cyrtandra chlorantha* is readily distinguished from *C. leucantha* by its longer vegetative indument, smaller leaves, larger and pilose inflorescence-bracts, the markedly longer hairs of its calyx and corolla, and the striking bright green color of the latter. With *C. desvoeuxii* Horne ex Clarke and possibly *C. glandulosa* Gillespie, the two new species here described make up a group readily characterized, among the Fijian species, by their glandular-pilose flowers.

Cyrtandra bracteolosa sp. nov.

Arbor gracilis ad 5 m. alta, habitu partibus juvenilibus minute et evanescenter furfuraceis exceptis glabra, ramulis gracilibus apices versus subquadrangularibus 2–3 mm. diametro inferne subteretibus cinerascens, internodiis 1.5–5 cm. longis; foliis oppositis, petiolis gracilibus leviter canaliculatis 1–2.5 cm. longis, laminis chartaceis in sicco viridibus, lanceolatis, (11–) 14–19 cm. longis, (3.5–) 4–6 cm. latis, basi attenuatis et in petiolum decurrentibus, apice gradatim longe acuminatis, margine dentibus 1–2 cm. remotis calloso-apiculatis manifeste undulato-crenatis, costa supra paullo elevata subtus prominente, nervis secundariis utrinsecus 5–8 arcuato-adscendentibus supra subplanis subtus elevatis marginem versus interconnexis, rete venularum laxo supra immerso subtus prominulo; inflorescentiis e nodis defoliatis orientibus cymosis, aliquot dichotome ramulosis, ad 6 cm. longis, paucifloris (floribus plerumque mox caducis), pedunculo ramulisque teretibus gracillimis (0.4–0.7 mm. diametro), pedunculo 10–25 mm. longo, internodiis 7–15 mm. longis; bracteis bracteolisque ad nodos subpersistentibus papyraceis vel submembranaceis oblongo-linearibus, 4–7 mm. longis, 0.8–1.2 mm. latis, obtusis 1-nerviis, distalibus dorso saepe obscure furfuraceis; floribus e nodis apicalibus solitariis, pedicello tereti 3–5 mm. longo; calyce membranaceo cupuliformi 4–5 mm. longo demum subrotato caduco, manifeste nervato, ad medium 5-lobato, lobis subaequali-

bus late deltoideis subacutis; corolla non visa; fructibus juvenilibus ellipsoideis levibus, stylo crasso circiter 5 mm. longo, stigmate incrassato bilobato.

VITI LEVU: Mba: Hills east of Nandala Creek, about 3 miles south of Nandarivatu, alt. 850–970 m., Sept. 25, 1947, *Smith* 6232 (A TYPE, US) (slender tree 5 m. high, in dense forest; young fruit green).

The cited specimen, although lacking corollas, seems definitely to represent a new species related to the species of § *Polynesieae* with freely branching inflorescences; this group in Fiji includes *C. denhamii* Seem., *C. ciliata* Seem., *C. taviunensis* Gillespie, and perhaps *C. montana* Gillespie. The new species differs from all of these in its narrow, linear bracteoles. These bracteoles bear a superficial resemblance to the calyx-lobes of *C. ciliata*, but actually the calyces of the two species are very dissimilar, and foliage differences are also pronounced. In comparison with *C. bracteolosa*, *C. taviunensis* has much larger bracteoles and calyx, while *C. montana* has the leaves and bracteoles considerably smaller and the calyx larger. *Cyrtandra denhamii*, apparently the closest ally of the new species, is very imperfectly known, but it is described as having an elongate peduncle, oblong bracteoles about 1 cm. long, and a subspathaceous calyx.

***Cyrtandra trichophylla* sp. nov.**

Arbor gracilis ad 6 m. alta, ramulis apices versus subteretibus 3–6 mm. diametro pilis pallidis ad 1.5 mm. longis obscure pluriseptatis copiose indutis, demum incrassatis ad 15 mm. diametro glabratis cinereis rugulosis; foliis oppositis, petiolis crassis (3–5 mm. diametro) leviter canaliculatis 1–2.5 cm. longis ut ramulis juvenilibus pilosis glabratisque, laminis in vivo carnosius in sicco subcoriaceis fuscescentibus, obovatis vel obovato-ellipticis, (12–) 14–28 cm. longis, (4–) 5.5–11 cm. latis, basi acutis vel attenuatis et in petiolum decurrentibus, apice breviter acuminatis vel cuspidatis, margine dentibus 1–3 per centimetrum inconspicue calloso-serratis, supra glabris (juventute dispersim sericeis), subtus pilis subtilibus pallidis 0.8–1.5 mm. longis obscure pluriseptatis densissime molli-sericeis, costa supra plana vel leviter elevata subtus prominente, nervis secundariis utrinsecus 7–11 adscendentibus vel erecto-patentibus supra planis subtus valde elevatis, rete venularum utrinque immerso; inflorescentiis trunco vel ramulis infra folia enatis vel interdum axillaribus, simpliciter cymosis, plerumque 3 (interdum 2- vel 4-) -floris, pedunculo pedicellisque gracilibus longitudine subaequalibus (vel pedunculo interdum subnullo) sub anthesi 10–15 mm. longis copiose pilosis (pilis subpatentibus pluriseptatis 1–2 mm. longis) demum subglabris; bracteis apice pedunculi in involucrium papyraceum monophyllum coalitis ad 10 mm. longis latisque, apice obtusis, utrinque ut pedicellis copiose pilosis (indumento intus persistentiore) demum deciduis; calyce subcarnoso campanulato sub anthesi 15–17 mm. longo et basim versus 6–7 mm. diametro superne ad 10–12 mm. ampliato utrinque (intus saepe densius) pilis eis pedicelli similibus copiose sericeo, lobis 5 subaequalibus deltoideis lanceolatis acutis 5–7 mm. longis; corolla

infundibulari sub anthesi circiter 25 mm. longa, tubo subcarnoso basim versus 3–5 mm. diametro faucibus ampliato extus superne ut calyce piloso intus glabro, lobis 5 subaequalibus sub anthesi patentibus submembranaceis oblongo-suborbicularibus 7–8 mm. diametro intus inconspicue pilosis (pilis debilibus 0.3–0.5 mm. longis stipitatis capitato-glandulosis); staminibus apicem tubi corollae versus affixis, filamentis 2–3 mm. longis, antheris ellipsoideis circiter 2 mm. longis; disco carnosio breviter cylindrico glabro 1–2 mm. alto; ovario anguste ellipsoideo glabro, stylo crasso circiter 10 mm. longo superne parce glanduloso-piloso, stigmate complanato obscure bilobato; fructibus ellipsoideis in vivo ad 4×2.5 cm. in sicco rugulosis, calyce caduco.

VITI LEVU: Ra: Ridge from Mt. Namama (east of Nandarivatu) toward Mt. Tomanivi [Mt. Victoria], alt. 1050–1120 m., Aug. 18, 1947, *Smith 5698* (A TYPE, US) (tree 5 m. high, in dense forest; corolla and stamens white; fruit when fresh white, ellipsoid, about 4×2 cm., greatly shrinking in drying); Mba: Hills east of Nandala Creek, about 3 miles south of Nandarivatu, alt. 850–970 m., *Smith 6246* (A, US) (slender tree 6 m. high, in dense forest; calyx green, with brown pubescence; corolla and anthers white; fruit white, when fresh about 4×2.5 cm., greatly shrinking in drying).

A species of § *Polynesiae*, the new species forms, with *C. involucrata* Seem. and *C. gillespieana* A. C. Sm. [*C. monticola* Gillespie], a group characterized by simple inflorescences with the two bracts joined to form a cup-like involucre. *Cyrtandra trichophylla* differs from its relatives in the prevailing obovate, larger, and thick-textured leaves, of which the lower surface is very densely sericeous with long, pale, obscurely septate hairs, and in its comparatively large calyx and corolla, the former being copiously sericeous on both sides.

Cyrtandra esothrix sp. nov.

Frutex vel arbor gracilis ad 6 m. alta, partibus novellis copiose sed minute brunneo-puberulis, ramulis gracilibus apices versus subquadrangularibus demum glabris, internodiis 1–2.5 (–4) cm. longis; foliis oppositis, petiolis gracilibus leviter canaliculatis vel semiteretibus 1–3 (–3.5) cm. longis ut ramulis puberulis glabrisque, laminis papyraceis in sicco viridibus vel fusco-viridibus, lanceolatis vel obovato-ellipticis, 10–18 cm. longis, 3–6 cm. latis, basi attenuatis et in petiolum decurrentibus, apice acuminatis et calloso-apiculatis, margine dentibus 1–3 per centimetrum calloso-mucronulatis conspicue serratis, supra glabris vel nervis parce puberulis, subtus nervis (et plerumque facie) primo pilis 0.1–0.3 mm. longis copiose puberulis demum subglabris, costa supra subplana subtus prominente, nervis secundariis utrinsecus 7 vel 8 adscendentibus supra planis subtus elevatis, rete venularum laxo subtus prominulo; inflorescentiis cymosis axillaribus etiam infra folia enatis breviter pedunculatis plerumque unifloris raro bifloris, bracteis bracteolisque oppositis inconspicuis deltoideis vel oblongis 1.5–2.5 mm. longis obtusis mox caducis, pedicellis gracilibus sub anthesi 5–15 mm. longis cum pedunculo bracteisque ut ramulis juvenilibus puberu-

lis demum glabratis; calyce subcarnoso in alabastro ovoideo et callosomucronulato, sub anthesi 8–12 mm. longo in lobos 2 vel 3 ovatos 3–4 mm. longos cuspidatos irregulariter rumpente, extus glabro vel basim versus parce puberulo, intus pilis crassis adscendentibus fulvis subrigidis 3–5-septatis 0.8–1.5 mm. longis copiose sericeo, mox caduco; corolla membranacea cylindrica inconspicue curvata ubique glabra sub anthesi ad 22 mm. longa, basim versus 5–6 mm. diametro superne ampliata, lobis 3 inferioribus rotundato-oblongis 5–6 mm. longis, 2 superioribus paullo minoribus; staminibus glabris tubo supra medium insertis, filamentis circiter 3 mm. longis, antheris oblongis circiter 2 mm. longis utroque rotundatis; disco carnoso annulari glabro circiter 1.5 mm. alto; gynoecio glabro, ovario subcylindrico-ovoideo, stylo crasso sub anthesi circiter 4 mm. longo demum elongato, stigmate subcapitato; fructibus anguste ovoideis ad 2 cm. longis in sicco rugulosis.

VITI LEVU: Naitasiri: Northern portion of Rairaimatuku Plateau, between Mt. Tomanivi [Mt. Victoria] and Nasonggo, alt. 870–970 m., Sept. 18, 1947, *Smith 6134* (A TYPE, US) (slender tree 4–6 m. high, forming dense thickets in forest; calyx white in bud, at length pale green; corolla and young fruit white); Mba: Western and southern slopes of Mt. Tomanivi, alt. 850–1150 m., *Smith 5098, 5267* (A, US) (shrubs 3–4 m. high, in dense forest; calyx pale green; corolla and fruit white).

A member of § *Polynesieae*, *C. esothrix* appears to be most closely related to *C. coleoides* Seem., a species with the same type of irregularly splitting calyx and a similar, but sparser, vegetative indument. The new species differs from *C. coleoides* most obviously in having the calyx copiously sericeous within (rather than glabrous), the several-celled hairs conspicuously protruding as soon as the calyx-bud breaks, and in having the flowers usually one per inflorescence (rather than several). *Cyrtandra coleoides* is a not infrequent species in upland Viti Levu, being represented in my present collection by nos. 5259, 5628, and 5813; its leaves are slightly larger than those of the new species and have the margins merely undulate rather than sharply serrate, while the indument of the nerves on the lower surface is evanescent.

Cyrtandra greenwoodiana sp. nov.

Arbor vel frutex ad 6 m. altus, ramulis gracilibus sub anthesi subquadrangularibus 1–3 mm. diametro et pilis fusco-brunneis pluriseptatis 0.1–0.3 mm. longis copiose et arcte indutis, mox glabratis subteretibus, internodiis 1–2 cm. longis; foliis oppositis, petiolis gracilibus semiteretibus (0.7–) 1–3 cm. longis ut ramulis pilosis glabratisque, laminis in sicco chartaceis saepe viridibus subtus pallidioribus, oblongo-ellipticis, (4–) 6–15 cm. longis, (2–) 4–6 cm. latis, basi obtusis, apice abrupte cuspidatis vel breviter acuminatis, margine dentibus irregularibus 1 vel 2 per centimetrum apiculatis manifeste undulato-serratis, supra glabris, subtus costa nervisque secundariis ut petiolis (saepe sparsim) pilosis alioqui glabris, costa et nervis secundariis utrinsecus 5–8 curvatis patentibus supra sub-

planis subtus valde elevatis, rete venularum subimmerso vel subtus laxe prominulo; inflorescentiis axillaribus unifloris, pedunculo gracili 5–12 mm. longo primo ut ramulis juvenilibus arcte piloso sub fructu subglabrato, bracteis apice pedunculi binis minutis lanceolatis 1–2 mm. longis arcte strigillosis caducis, pedicello pedunculum subaequante vel sub fructu ad 15 mm. longo similiter strigilloso; calyce submembranaceo inaequilateraliter campanulato, in alabastro clauso et conspicue caudato-apiculato, sub anthesi irregulariter fisso saepe subspathaceo, 15–16 mm. longo, 5–7 mm. diametro, utrinque pilis eglandulosis pluriseptatis (extus 0.2–0.3 mm. longis caducis, intus ad 0.7 mm. longis persistentibus) induto, lobis 5 lanceolatis 5–7 mm. longis, saepe omnino ad apicem connatis, interdum 1 vel 2 liberis aliis connatis, calyce e basi mox caduco; corolla membranacea infundibulari sub anthesi lobis inclusis 20–25 mm. longa et basim versus 3–5 mm. diametro superne ampliata, tubo utrinque glabro, lobis 5 subaequalibus oblongo-suborbicularibus circiter 5 mm. longis intus subtiliter et minute glanduloso-pilosis; staminibus in faucibus corollae insertis, filamentis 2–3 mm. longis, antheris ellipsoideis longitudine aequalibus; disco annulari-pulvinato haud 0.5 mm. alto; ovario anguste ellipsoideo glabro, stylo crasso circiter 7 mm. longo obscure glanduloso-piloso, stigmate incrassato bilobato; fructibus ellipsoideis in vivo circiter 2.5 cm. longis in sicco rugulosis, basi styli subpersistente.

VITI LEVU: M b a : Mt. Nairoso, eastern flank of Mt. Evans Range, alt. about 1050 m., May 14, 1947, *Smith 4412* (A TYPE, US) (tree or shrub 4–6 m. high, in crest thickets at base of ultimate pinnacle; corolla and fruit pure white, the mature fruit about 2.5×1.5 cm., shrinking in drying); northern portion of Mt. Evans Range, between Mt. Vatuyanitu and Mt. Natondra, alt. 700–900 m., *Smith 4304* (A, US) (slender tree 5 m. high, in dense forest; calyx pale green; corolla and fruit white); Mt. Evans Range, alt. about 970 m., *Greenwood 1260* (US) (shrub 3–4 m. high, in thick forest; flowers white).

Cyrtandra greenwoodiana is characterized by the close (and often sparse) indument of its vegetative parts and inflorescence, its one-flowered inflorescence with minute bracts subtending the solitary pedicel, and its large, unevenly cleft, often one-sided and subspathaceous calyx, which is densely short-pilose within. A member of § *Polynesieae*, its closest ally seems to be *C. pritchardii* Seem., from which it differs in its more obvious indument, its slightly smaller leaves, its consistently one-flowered inflorescence, and its much larger calyx and corolla. The calyx of *C. pritchardii* is only about 7 mm. long and is subequally 5-lobed, and its corolla is about 16 mm. long. It is probable that some of the specimens from central Viti Levu identified as *C. pritchardii* will be better referred to the new species, but a final circumscription of Seemann's species (type from Ovalau) may be delayed until the genus is revised for Fiji. Another species of this relationship, *C. spathacea* A. C. Sm. (type from Kandavu), is essentially glabrous throughout and has much larger, many-nerved leaves. It is a pleasure to name the new species for Mr. William Greenwood, a long-time resident of Fiji, who has collected many unusual species on the Mt. Evans Range of northwestern Viti Levu.

Cyrtandra harveyi Seem. Fl. Vit. 182. 1866; C. B. Clarke in DC. Monogr. Phan. 5: 281. 1883.

VANUA LEVU: Mathuata: Southern base of Mathuata Range, north of Natua, *Smith* 6761 (A, US); slopes of Mt. Numbuiloa, east of Lambasa, *Smith* 6343 (A, US), 6529 (A, US).

Cyrtandra harveyi (§ *Polynesieae*) is one of the most frequent species of the genus in Fiji at low elevations, occurring from near sea-level up to 500 m. in the forest undergrowth, especially on Vanua Levu. In addition to the recently collected material above cited it is represented by: Vanua Levu: *Harvey* (type at Kew, isotype at Gray Herbarium), *Smith* 367, 1847, *Degener & Ordonez* 13899, 13969, 14088; Viti Levu: *B. E. Parham* 17, *Tabualewa* 15596. The specimens are from shrubs or slender trees 1–4 m. high; the corolla is cream white to pale yellow, and the mature fruit is white and about 2×1 cm., with a quickly caducous calyx.

Although the available specimens show some variability in leaf-size and marginal serration, there seems no doubt that they represent the same well circumscribed species. The branchlets, petioles, pedicels, and calyx are copiously and closely sericeous with dark golden subascending (less commonly subspreading) several-celled hairs 0.2–1 mm. long, both leaf-surfaces being similarly pilose but eventually subglabrate; the inflorescence is axillary or lateral below the leaves, openly cymose, pedunculate, inconspicuously bracteate, 2–4-flowered; the calyx is closed and apiculate in bud, eventually 10–12 mm. long and unequally (sometimes deeply) 5-lobed; the corolla is 20–25 mm. long, subequally 5-lobed, copiously to sparsely spreading-pilose with several-celled gland-tipped hairs 0.1–0.5 mm. long; the stamens are highly placed on the corolla; and the style often equals the corolla in length, having scattered glandular hairs distally.

Cyrtandra xanthantha sp. nov.

Frutex ad 4 m. altus, ramulis subteretibus vel obscure quadrangularibus apices versus 1.5–3 mm. diametro et pilis patentibus fusco-brunneis pluri-septatis 0.8–1.5 mm. longis copiose indutis, demum glabratiss, internodiis brevibus 5–8 mm. longis, nodis subincrassatis; foliis oppositis, petiolis gracilibus basim versus canaliculatis 5–15 mm. longis ut ramulis juvenilibus patenti-pilosis, laminis chartaceis in sicco fusco-viridibus lanceolatis, (8–) 11–18 cm. longis, (3–) 4–5.5 cm. latis, basi acutis sed haud decurrentibus, apice calloso-acuminatis, margine dentibus circiter 2 per centimetrum calloso-apiculatis inconspicue denticulatis, utrinque pilis pluriseptatis 0.5–1 mm. longis dispersim patenti-pilosis, costa nervisque secundariis utrinsecus 7–9 subadscendentibus supra subplanis subtus valde elevatis. rete venularum supra immerso subtus prominulo; inflorescentiis axillaribus simpliciter cymosis 3–4-floris, pedunculo pedicellisque longitudine subaequalibus 5–10 mm. longis gracilibus ut ramulis juvenilibus copiose pilosis. indumento pedicelli pallido, bracteis mox caducis non visis; calyce membranaceo campanulato sub anthesi 5–6 mm. longo, extus ut pedicellis piloso (pilis pallidis 0.5–1.3 mm. longis multiseptatis eglandulosis), intus glabro.

fere ad basim 5-lobato, lobis deltoideis subacutis, 3 interdum altiuscule connatis; corolla membranacea infundibulari sub anthesi lobis inclusis 22–25 mm. longa et basi 4–5 mm. diametro superne leviter ampliata, extus pilis subtilibus pluriseptatis 0.2–0.4 mm. longis capitato-glandulosis copiose sed inconspicue induta, intus glabra, lobis 5 subaequalibus oblongo-suborbicularibus 4–6 mm. longis; staminibus apicem corollae tubi versus insertis, filamentis 2–3 mm. longis, antheris ellipsoideis circiter 2 mm. longis; disco carnosio cupuliformi glabro circiter 1.5 mm. alto; ovario anguste ellipsoideo glabro, stylo 7–10 mm. longo subtiliter glanduloso-piloso, stigmatе incrassato bifido; fructibus immaturis ellipsoideis ad 1.5 cm. longis rugulosis styli basi persistente coronatis.

VITI LEVU: Mba: Slopes of the escarpment north of Nandarivatu, alt. 550–800 m., Sept. 29, 1947, *Smith 6277* (A TYPE, US) (shrub 3–4 m. high, in woods along stream; calyx white; corolla pale yellow, the lobes at first greenish, then yellow).

Cyrtandra xanthantha is a species of § *Polynesieae*, characterized by its simple, few-flowered inflorescence with caducous bracts, its comparatively small and deeply 5-lobed calyx being eglandular-pilose without and glabrous within, and its corolla being 22–25 mm. long and finely glandular-pilose without. Its closest relatives seem to be *C. harveyi* Seem. and *C. pritchardii* Seem. From *C. harveyi* it differs in the more obvious and more definitely spreading indument of its vegetative parts and inflorescence, its smaller and comparatively short-petiolate leaves, and its smaller, more deeply lobed calyx. *Cyrtandra pritchardii* is a more distant ally, differing obviously from the new species in its closer and sparser indument (essentially lacking on the flowers) and its longer-petiolate, more conspicuously toothed leaves.

Cyrtandra jugalis sp. nov.

Frutex vel arbor parva ad 5 m. alta, ramulis gracilibus subteretibus vel obscure quadrangularibus apices versus copiose pilosis (pilis patentibus fuscis 0.4–0.7 mm. longis 3–7-septatis) inferne glabratis; foliis oppositis, petiolis leviter canaliculatis (5–) 10–25 (–30) mm. longis ut ramulis juvenilibus pilosis superne angulatis haud alatis, laminis chartaceis in sicco fusco-viridibus subtus saepe pallidioribus, lanceolatis vel lanceolato-ellipticis, (6–) 10–19 cm. longis, (1.5–) 2.5–5 (–6) cm. latis, basi acutis vel subattenuatis, apice gradatim acuminatis et calloso-apiculatis, margine dentibus 2 vel 3 per centimetrum calloso-mucronulatis conspicue et irregulariter serratis, supra glabris, subtus molliter pilosis (pilis fusco-aureis 0.3–0.5 mm. longis inconspicue pluriseptatis saltem nervis longe persistentibus), costa supra subplana subtus prominente, nervis secundariis utrinsecus 5–8 longe adscendentibus supra planis subtus inconspicue elevatis, rete venularum laxo subimmerso; inflorescentiis axillaribus vel ramulis defoliatis enatis simpliciter cymosis plerumque 3-floris pedunculatis, pedunculo gracili 2–6 cm. longo raro subnullo cum pedicellis bracteisque ut ramulis juvenilibus piloso (pilis patentibus vel subadscendentibus 0.2–

0.7 mm. longis); bracteis apice pedunculi binis ovato-lanceolatis, 5–13 mm. longis, 1.5–4 mm. latis, subacutis, basi non vel haud connatis, demum caducis; pedicellis gracilibus sub anthesi et fructu (8–) 15–25 mm. longis; calyce subcarnoso in alabastro ovoideo longe apiculato, sub anthesi campanulato 10–14 mm. longo apice ad 12 mm. diametro utrinque ut pedicello piloso, ad medium 5-lobato, lobis subaequalibus deltoideo-lanceolatis acuminatis 5–8 mm. longis; corolla membranacea infundibulari sub anthesi lobis inclusis 18–24 mm. longa basi 2.5–4 mm. diametro superne ampliata, extus pilis pallidis pluriseptatis 0.4–1 mm. longis molliter patenti-pilosa, tubo intus glabro, lobis 5 subaequalibus suborbicularibus sub anthesi patentibus 5–8 mm. diametro intus copiose glanduloso-pilosis (pilorum stipitibus pluriseptatis 0.1–0.3 mm. longis); staminibus apicem corollae tubi versus insertis, filamentis crassis 1–2 mm. longis, antheris oblongis 2–3 mm. longis utroque rotundatis; disco carnosio glabro pulvinato-cupuliformi 1–1.5 mm. alto apice undulato; ovario elongato-ovoideo glabro, stylo crasso tereti sub anthesi 4–8 mm. longo ut corollae lobis glanduloso-piloso, stigmatibus subpeltatis; fructibus calyce mox caduco in vivo ellipsoideo ad 1.5×1 cm. in sicco ruguloso.

VITI LEVU: Mba: Summit of Mt. Nanggaranambuluta [Lomalangi], east of Nandarivatu, *Smith* 4878 (A, US); ridge between Mt. Nanggaranambuluta and Mt. Namama, alt. 1050–1120 m., June 30, 1947, *Smith* 4994 (A TYPE, US); western slopes of Mt. Tomanivi [Mt. Victoria], *Smith* 5319 (A, US); Ra: Ridge from Mt. Namama toward Mt. Tomanivi, *Smith* 5695, 5696, 5709, 5715 (all A, US); Nandronga & Navosa: Vicinity of Nandrau, *Degener* 14904 (A); northern portion of Rairaimatuku Plateau, between Nandrau and Nanga, *Smith* 5569 (A, US).

The cited specimens are from shrubs or slender, freely branching trees 2–5 m. in height, occurring in dense forest at elevations of 725–1120 m. The corolla, stamens, and style are pure white to cream-white, and the mature fruit is white. Recorded local names are *mindra* (*Smith* 4994) and *mbetambeta* (*Degener* 14904).

The described species, of § *Polynesiae*, is quite frequent on the long ridge that curves from Nanggaranambuluta to Tomanivi and dominates north-central Viti Levu. It seems strange that Gillespie did not obtain material of the species, or at least that he did not describe it. I have examined type material of most of his species, and all are well described and figured; the only one that suggests *C. jugalis* is *C. prattii*, a species with larger and more copiously nerved leaves, an elongate inflorescence with solitary lateral flowers, pedicels only about 4 mm. long, and a somewhat larger, unequally lobed calyx.

Closer relatives of the new species are *C. anthropophagorum* Seem. and *C. hornei* Clarke, both of which have comparatively small flowers. This group of species is characterized by its indument of several-celled eglandular hairs and its few-flowered inflorescence with free, opposite, rather small bracts. In characters of indument, *C. jugalis* is intermediate be-

tween *C. anthropophagorum* and *C. hornei*, the former having more copious and softer pubescence on, both vegetative and inflorescence parts and the leaves less obviously serrate, the latter being soon essentially glabrate on vegetative parts, calyx, and corolla.

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